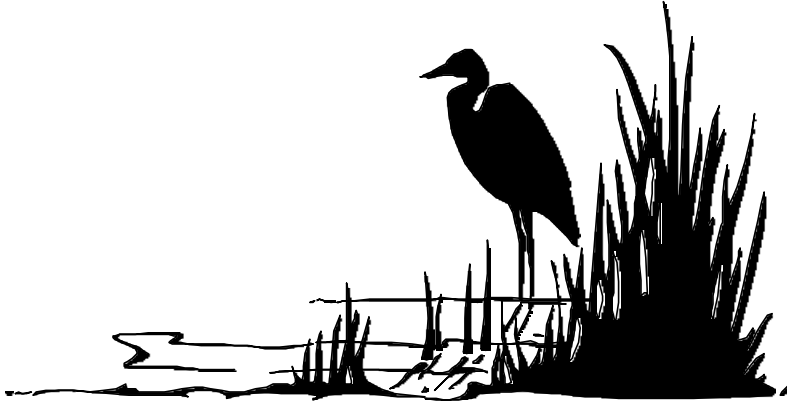


COASTAL NONPOINT SOURCE POLLUTION CONTROL PROGRAM



LONG - TERM GOAL (15 YEARS)

To ensure that all applicable management measures and additional measures to reduce nonpoint source pollution are implemented by 2014 for the purpose of attaining designated uses

INTRODUCTION

The Virginia Coastal Nonpoint Source Pollution Control (CNPSPC) program was developed in response to the federal Coastal Zone Management Act Reauthorization Amendments (CZARA) of 1990. The 1990 amendments instituted a new program targeting reduction of nonpoint source (NPS) pollution in coastal areas of the United States, including the Great Lakes, entitled Protecting Coastal Waters, Section 6217. Development and implementation of a CNPSPC program is required by CZARA for those states that have an approved coastal zone management plan. Virginia's coastal zone management plan was approved in 1986.

The CNPSPC program is one of the core programs of the Virginia Coastal Program (VCP). The Virginia Coastal Program is a networked program with eight core programs operated by different state agencies. The Virginia Department of Environmental Quality (DEQ) is the lead agency and is responsible for administering the State's coastal program. The NPS pollution control core program is administered by the Department of

Conservation and Recreation (DCR). DCR is identified as the lead agency for NPS pollution in Section 10.1-104.1 of the *Code of Virginia*.

Section 6217 of CZARA states that:

The purpose of the program shall be to develop and implement management measures for nonpoint source pollution to restore and protect coastal waters, working in close conjunction with other State and local authorities.

To support this requirement, the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA) jointly released the (g) *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. CZARA defines the term "management measures" as "...economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint sources of pollution,

which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives.”

Virginia submitted a program document in September 1995 to NOAA and EPA for approval. In 1998, NOAA and EPA responded with a findings letter stating which management measures the Virginia program did and did not meet. This resulted in Virginia receiving “condition approval” of the program. The findings also required that, within three years, all program conditions would be addressed. Subsequent to this, and in response to key actions in the President’s Clean Water Action Plan, NOAA and EPA provided Final Administrative Changes for program implementation in October 1998 and an update in March 1999.

This new guidance requires coastal states to develop 15-year program strategies and five-year implementation plans. The administrative changes are intended to provide states with additional flexibility in meeting the requirements of Section 6217 of the CZARA. In response to the Clean Water Action Plan and guidance from EPA and NOAA to coordinate NPS pollution activities, the five- and 15-year documents have been developed and incorporated as a chapter of the 1999 Virginia NPS Management Program.

There are eight broad categories identified by Section 6217: agriculture, forestry, urban development, marina and boat operation, hydromodification, wetlands, monitoring and tracking, and technical assistance. For each of these source categories the (g) guidance contains several specific management measures that must be implemented through enforceable policies or mechanisms (laws, regulations and executive orders), back-up enforceable policies, or through voluntary efforts. Section 6217 also provides for the implementation of “additional” management measures, which are intended to allow states to identify other appropriate approaches to implementation. Implementation may include new programs, educational efforts and modifications to existing programs.

ISSUE IDENTIFICATION

Continuing discussions with NOAA and EPA have resulted in some of the initial conditions being met since the *Findings* letter was released in 1998. The priority issues for Virginia are considered as those remaining issue areas identified in the findings letter where the management measures are not being implemented sufficiently. These issues are presented as priorities for the five- and 15-year planning documents and represent the primary areas of program focus. Since Virginia’s program currently meets several of the management measures through enforceable policies and mechanisms, permit requirements, enforcement actions, reporting requirements, education and voluntary efforts, it is concluded that the state is already implementing those program measures. This does not mean that supplementary efforts would not be considered, rather Virginia will continue to monitor and track implementation of these approved program elements and continue to actively evaluate procedures to achieve greater levels of efficiency.

The following is a listing of the program elements considered to be out of compliance with program requirements by EPA and NOAA. These program elements are identified as priority issue areas for the CNPSPC program. This list follows the sequence of the *Findings* letter and does not reflect a particular prioritization of the issue areas. The list is followed by a section describing existing efforts as well as the programmatic approaches to be implemented within the 15-year planning horizon.

The program currently does not include:

- C Management measures in conformance with the guidance for irrigation water management;
- C A demonstration of the ability to achieve implementation of the forestry management measures, which should be accomplished through measurable results;
- C Management measures to reduce total suspended solids outside of the Chesapeake Bay Preservation Areas for new development;
- C Management measures for existing development by identifying priority watershed pollutant reduction opportunities and a schedule for implementing appropriate controls;

- C Management measures for adequate separation distance between new on-site disposal systems and groundwater closely hydrologically connected to surface water and limiting nitrogen loadings from new and operating onsite disposal systems near nitrogen limited surface waters;
- C Management measures for roads, highways and bridge runoff systems and for local roads not within the Chesapeake Bay Preservation Areas;
- C Management measures for stormwater runoff from boat hull maintenance operations, technical assistance and fish waste;
- C A process to improve surface water quality and restore instream and riparian habitat through the operation and maintenance of existing modified channels;
- C Management measures to manage the operation of dams to protect surface water quality and instream and riparian habitat and to assess nonpoint source pollution problems resulting from excessive surface water withdrawals;
- C A process to identify and develop strategies to solve existing nonpoint source pollution problems caused by streambank or shoreline erosion that do not come up for review under existing permit authorities;
- C A process to provide sufficient technical assistance for marina development and operation; and
- C A plan to assess over time the success of the management measures in reducing pollution loads and improving water quality.

PROGRAM DESCRIPTION

AND APPROACH

The 1995 program submittal document describes the laws, regulations and incentive-based tools available to Virginia to implement the (g) guidance management measures. These laws and programs will not be reiterated herein; however, it is important to note that Virginia was able to show how most management measures were addressed through several existing laws and programs. Based on review of the program submittal, NOAA and EPA concluded Virginia has sufficient enforceable policies and mechanisms to implement most of the (g) guidance management measures. As a result, Virginia was given conditional approval for its Coastal Nonpoint Source Pollution Control Program.

In March of 1999, NOAA and EPA provided additional information on the five- and 15-year plan requirements. One element refers to the overall 15-year approach a state will take, whether it is categorical (agriculture, urban, forestry), geographical (county, watershed, basin), or a combination of the two. Virginia will continue to implement the program through a combination of categorical and geographical approaches as outlined in the preceding chapters. There are two primary reasons for this approach.

First, the categorical approach is more appropriate when seeking legislative or statewide resolution of an issue. For example, certain agricultural activities (crop production) are conducted throughout the state. A logical approach to addressing any identified concern would be to affect the resolution on a statewide basis. Irrigation, on the other hand, is used less than four percent of farms. A logical approach to addressing irrigation issues is to work closely with the producers on a voluntary and technical basis to address NPS pollution.

Second, the ability to implement some of the management measures is more appropriate through a geographical approach. This is particularly true in Virginia where 494 watersheds are prioritized based on nonpoint source pollution potential. For certain management measures, such as streambank erosion, it is logical to identify specific watersheds or stream segments where erosion is contributing to NPS pollution. By maintaining the ability to address issues in a flexible

and innovative manner Virginia is able to target limited resources to those areas or issues requiring implementation of management measures. This approach also provides flexibility to coordinate Section 6217 activities with other NPS pollution programs. Furthermore, a combination approach provides an opportunity to address geographically and categorically specific issues through identification and implementation of additional management measures.

Virginia considers this approach to best reflect the purpose of the provisions in the *Administrative Changes* and CZARA for implementing the management measures. Pursuant to future program evaluations, it may be decided that certain categorical or geographical enhancements must be instituted to achieve the intent of CZARA and the (g) guidance as well as the beneficial use of waterways. Additional management measures are intended to allow a program to implement innovative approaches to those program elements that are unable to fully meet the desired improvements in water quality. For example, it is possible that a geographical area has fully implemented all management measures but still cannot meet water quality objectives. In this example the area should be evaluated to determine what other actions are appropriate for implementation.

Agriculture

Agriculture is a large and diverse industry in Virginia. It accounts for approximately nine million acres (30 percent) of Virginia's land use. Agricultural land uses include row crop production of grains, forage, peanuts, cotton, tobacco, and vegetables; pasture and hay production necessary for beef and dairy production; as well as facilities for poultry, swine, beef, dairy, and equine operations; orchards; and ornamental nursery operations.

Nonpoint source pollutants typically associated with agriculture include nutrients, sediment, pathogens and toxics. These pollutants can escape crop field and livestock production areas and enter surface and ground water systems. When their levels in water become significant, they can have a negative impact on aquatic life, cause a reduction in dissolved oxygen, clog water treatment system filters and weaken or destroy aquatic vertebrates and invertebrates as well as their habitat. Human use of the water may become affected as a

result of excessive plant growth, increased turbidity, damaged fisheries and wildlife habitat. NPS pollution associated with agricultural activities can also impact the water quality of ground water supplies. As detailed in the 1995 program document, Virginia has many regulatory and voluntary programs to address agricultural issues. However, increased technical assistance to irrigators needs to be provided to reduce potential NPS pollution.

For additional NPS program strategies, objectives, and tasks regarding implementation of agricultural efforts refer to Chapter VI Agriculture.

Irrigation Water Management

The extent of irrigation in Virginia does not account for a significant portion of agricultural activities. According to the 1997 U.S. Department of Agriculture census, 84,926 acres of agricultural land was irrigated in Virginia. This is less than four percent of the total crop (2.52 million acres) acreage in Virginia. Within the coastal zone there are 33,280 acres of irrigated land, which is little more than one percent of the total irrigated land in Virginia. Though this activity is not considered a significant contributor to NPS pollution, there is still a need to provide technical assistance and address any concerns that do exist. Included in Virginia's approach will be the development and distribution of publications to local governments, irrigators, plan writers and reviewers, soil and water conservation districts (SWCDs), Virginia Cooperative Extension (VCE), and other state and federal agencies.

Prior to the 1960s, irrigation equipment in Virginia consisted primarily of portable pipe systems and was used almost solely on high value crops, such as tobacco, fruits and vegetables. The extensive growth in irrigation that followed came about, in part, as a result of the development of less labor-intensive irrigation systems, specifically traveling guns and center pivots. These are both capable of efficiently irrigating large acreages of field crops, such as corn, soybeans and peanuts.

During the past 15 years relatively few large-scale systems have been installed. Much of the growth that has occurred during this period has been via the implementation of drip/trickle irrigation technology.

Additionally, recent years have shown technological changes affecting the way irrigation is accomplished. To meet these changes Virginia will update BMP pamphlets, brochures and technical documents as well as develop new technical guidance. Virginia will also conduct a series of workshops for irrigators, local government officials, environmental planners, and others that will present information on current proper techniques in irrigation, how to minimize the potential for nonpoint source pollution and installation of appropriate safety devices and controls for chemigation.

It is anticipated there will be follow up contact with the workshop participants to determine the effectiveness of the workshops and how many participants implemented the prescribed practices. As part of a long-term approach Virginia will continue to assess other educational and technical guidance and tracking opportunities. This may include working with academic institutions, SWCDs, VCE and VDACS to determine what additional courses, workshops, or fieldwork is appropriate to support and promote efficient irrigation techniques. Virginia will also analyze the option of installing a computer-based irrigation/water needs system in local VCE offices. This system would incorporate information provided by the irrigators and Cooperative Extension agents. The irrigators, in turn, would receive some form of notification or have direct access to a database describing when and how much water should be applied.

There is no indication that the NPS pollution potential resulting from irrigation water management is significant in Virginia. However, this program element is recognized as benefitting from technical assistance. Virginia will initiate a project in 1999 to begin providing technical assistance to irrigators.

Forestry

Since 1988, the Department of Forestry (DOF) has conducted an education and information program for the logging community on the impact of BMPs on living resources and water quality. The core program consists of one-on-one contact, field examinations, logger training and close collaboration with the forest industry, consultants and landowners. The Silvicultural Water Quality Task Force, an advisory group to the State Forester, introduced legislation creating an outcome based sedimentation law. This legislation became law in 1993 and gave DOF the ability to stop logging activities if stream sedimentation is occurring. During 1995, the forest industry-backed Sustainable Forestry Initiative took hold and most BMP and water quality training efforts were sponsored by the Virginia Forestry Association. Training sessions are still conducted annually, statewide, on silvicultural practices, business, safety and water quality.

As with other nonpoint sources, water quality degradation from forestry sources is a result of on-site practices, soil types, topography, landowner attitude toward conservation, and technical assistance availability. Virginia's forestry efforts remain outcome-based and voluntary in terms of which BMPs are utilized to protect water quality.

Currently, DOF uses two characterization techniques to track BMP and water quality impacts from forestry operations. Forestry inspectors conduct more than 2,500 inspections annually by visiting sites almost all are visited multiple times. The form used by the inspectors includes determining if the appropriate BMPs have been installed and are installed correctly. The past several years have shown that more than 90 percent of inspections report appropriate use and installation of BMPs. The other characterization technique is a semi-annual audit of 30 randomly selected sites. DOF believes this to be an appropriate indicator that is consistent and measurable. The DOF program combines education and information with an inspection program tied to outcome-based measures. The silvicultural water quality law enables DOF to stop harvesting operations if sediment is entering waterways, recommend corrective actions and impose civil penalties. The semi-annual audit evaluates both BMP implementation and effectiveness levels in the context of identified active water quality impacts.

Virginia recognizes the strong NPS pollution potential from forestry operations throughout the state. Efforts to determine water quality impacts and use of BMPs will continue to be reported. The tracking and monitoring aspects of Virginia's current program are sufficient to identify and address problems as well as provide for making warranted adjustments to how forestry BMP practices are implemented.

For additional NPS program strategies, objectives, and tasks regarding implementation of forestry efforts refer to Chapter VII Forestry.

Urban

The conversion of the land surface from undeveloped open and woodland space to an urbanized setting complete with housing, commercial and transportation infrastructure, causes a significant change in the surface runoff hydrology eliminating opportunities for infiltration and flow attenuation. This developed condition increases the volume and peak flow rate of runoff from rainfall. During the construction process excess runoff can become laden with sediment and nutrients which are then deposited in downstream channels and streams.

The post construction, or developed, condition increase in runoff can cause severe accelerated erosion of stream channel bed and banks, depositing additional sediment and nutrients in the downstream systems, as well as destroying the various habitats found within the stream channel.

The urbanized landscape also collects and stores various urban pollutants such as sediments, nutrients and toxics on impervious surfaces. During storm events these deposited pollutants are quickly and easily flushed from impervious surfaces resulting in potentially high concentrations of pollutant laden runoff. Finally, the urbanizing landscape typically contains an increasing number of privately owned on-site sewage disposal systems which, over time, may release pathogens to the surface runoff.

For additional NPS program strategies, objectives, and tasks regarding implementation of urban efforts refer to Chapter VIII Construction and Development. For watershed efforts refer to Chapter V Watershed Prioritization.

Total suspended solids reductions for new development

There are three main programs that can address the issue of total suspended solids (TSS) in Virginia, the Erosion and Sediment Control (ESC) law, the Chesapeake Bay Preservation Act (CBPA), and the Stormwater Management Act (SMA). The ESC and CBPA are mandatory programs and specifically address land disturbance activities. The SMA is a voluntary program and is only required for state projects and in localities that have a stormwater ordinance.

The ESC program requires every county, city and incorporated town to adopt a local ordinance consistent with the state regulations. The law also requires local government personnel to be trained and certified through the DCR Erosion and Sediment Control Certification Program, which is offered several times a year. The law requires implementation of an approved ESC plan for non-exempt land disturbing activities greater than 10,000 square feet.

The CBPA requires local governments in Tidewater, Virginia to designate Chesapeake Bay Preservation Areas and adopt a land management program based on the Chesapeake Bay Preservation Areas Designation and Management Regulations. Chesapeake Bay Preservation areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). Sensitive features such as tributary streams, shorelines and many wetlands are included in RPAs along with a 100 foot buffer adjacent to these features. The buffer is deemed to achieve a 75 percent reduction in sediments. RMAs are designated contiguous to the entire inland boundary of the RPA, and in many localities include the entire jurisdiction. Within Chesapeake Bay Preservation Areas, the threshold for ESC requirements is reduced from 10,000 to 2,500 square feet of land disturbance. In addition, there are requirements for no-net increase in stormwater pollutant loadings from new development and a 10 percent reduction in stormwater loadings from redevelopment. These requirements can be met through on-site best management practices or through an approved regional stormwater management program. The regulations also require that the site design criteria of minimizing land disturbance and impervious cover, and preserving existing vegetation be incorporated into the local development review process.

The SMA addresses permanent changes in stormwater runoff that result from development and increases in impervious surfaces. The SMA and regulations specify minimum technical and administrative requirements for local programs and state agency projects. It is applicable to development projects that disturb one acre or more. The technical requirements include water quality and water quantity control criteria. Compliance with the SMA is required for state agencies. For localities that choose to adopt a stormwater ordinance, compliance with the minimum criteria is required. Currently, in Tidewater, Virginia, nine localities have adopted stormwater ordinances incorporating the SMA.

Though not specifically targeted at reductions in TSS, the Tributary Strategy process does contribute to this by seeking reductions in nutrients and sediment loads. The Tributary Strategy process relies on local decision-making and public participation to determine solutions to identified problems. The goals are intended to improve water quality, reestablish habitat, including dissolved oxygen, water clarity and underwater grasses, and to restore fish, shellfish, and other living resources. Implementation of the final proposed strategies is voluntary but provides an opportunity to work with localities, counties, and planning district commissions (PDCs) to incorporate the strategies into comprehensive plans, site plan review processes, and stormwater and zoning ordinances.

The Tributary Strategy process in conjunction with continued ESC certification, better levels of enforcement, a tracking database, and NPDES phase II requirements, will allow Virginia to be able to reduce TSS from new development areas. Additionally, it is anticipated that future changes to the stormwater regulations will occur and further strengthen Virginia's ability to address TSS.

Virginia recognizes that TSS is a significant potential source of NPS pollution, however, it is difficult to identify and address TSS when no state or federal standards exist for sediment. Based on the fact that a small percentage of the coastal zone is outside of RPAs and RMAs, Virginia does not consider this program element to have a significant impact. However, efforts will be initiated in 1999 to address TSS reductions in those not included as an RPA or RMA. The main thrust of this effort will be to work with localities outside RPAs and RMAs to develop and implement stormwater management ordinances and plans that reduce runoff from new development.

Priority watershed pollutant reduction and existing development

There are several programs in Virginia that address or support pollution reduction at the watershed level. The Tributary Strategy process, the NPS pollution watershed assessment process, EPA's total maximum daily load (TMDL) program, Section 319 NPS pollution program, the Water Quality Improvement Act (WQIA), the 305(b) report, and the Water Quality Monitoring, Information

and Restoration Act. Development and implementation of stormwater management plans also assist in pollutant reductions. The 303(d) report, which identifies impaired waters, is presented as part of the biennial 305(b) reporting process.

A watershed or hydrologic unit is defined as a land area drained by a river or stream, or system of connecting rivers and streams such that all water within the area flows through a single outlet. In Virginia, 494 individual watershed units have been identified. More than 100 watershed units, in whole or in part, are within the coastal zone. These watersheds are assessed biennially through the *Nonpoint Source Pollution Watershed Assessment* reporting process, which incorporates information on agriculture, forestry and urban loadings. The watersheds are ranked as high, medium or low based on their respective NPS pollution potential. The data collected allows for ranking watersheds due to activities that contribute to NPS pollution.

The assessment presents data relating to agriculture NPS pollution as three types: 1) nutrient loads from agricultural crop, pasture and hay lands; 2) nutrients from agriculturally produced animals; and 3) erosion from agricultural cropland and pasture land. Data presented for urban NPS pollution is identified as nutrient loads from urban areas and erosion from urban lands and construction sites. The forestry rankings are affected by the number of acres subject to silvicultural activity, specifically erosion from harvesting and site preparation.

The Tributary Strategy process will identify specific pollutants to be reduced throughout the Chesapeake Bay Watershed, which encompasses almost all of the coastal zone. The priority pollutants targeted for reduction are nitrogen, phosphorus and sediment. There are several tributary strategies for the major rivers discharging to the Chesapeake Bay, which are the Shenandoah and Potomac, Rappahannock, York, and James rivers. Additional strategies for those smaller drainage basins that discharge directly to the bay will also be developed. Virginia anticipates completion of these strategies in 1999 - 2000. The strategies will identify the level(s) of reduction to be achieved in a specified time period and will be specific to each river basin.

Through the Clean Water Act of 1987, the total

maximum daily load (TMDL), 305(b) report and 303(d) list contain additional information to be utilized by Virginia in promoting watershed planning programs. The 305(b) report describes the current status of all waters in the state. The report is required to monitor and track whether or not waters meet the federal guideline of fishable and swimmable, also known as beneficial uses. The 303(d) list is a list that describes which stream segments do not meet current water quality standards. Those segments not meeting a standard will be listed as "impaired". The reason for the impairment is also provided and categorized as point sources, nonpoint sources or unknown. In addition, the report identifies stream segments that are threatened. These impaired and threatened stream segments are then targeted for pollution abatement or prevention activities.

To further ensure that impaired stream segments are properly addressed, EPA requires states to implement TMDLs in the watershed. A TMDL is intended to identify the maximum levels of pollutant inputs a body of water is capable of receiving while retaining its ability to support living resources and not be a threat to human health. Virginia currently has approximately 500 TMDLs listed for completion (point and nonpoint source) by the year 2010. Approximately one half of these appear to be associated with NPS pollution. For those watersheds where an impaired stream segment exists as a result of NPS pollution, appropriate management measures will be implemented and monitored to determine the effectiveness of the BMPs.

The Virginia Water Quality Improvement Act, in Section 10.1-2127, allows DCR to work with local and state agencies to develop cooperative NPS pollution management programs in defined geographic regions of the state. In response to this, DCR implemented the Cooperative Watershed Initiative (CWI) in 1998. It is anticipated that the CWI will enhance DCR's ability to manage and coordinate its NPS pollution programs. Specific to this program is that it covers the area of the coastal zone in southeastern Virginia that is currently excluded from the Chesapeake Bay Program initiatives. The CWI is designed to be a process driven by the priorities identified by local decision-makers and may result in watershed planning initiatives similar to the Tributary Strategies developed for the Chesapeake Bay watershed. The act also requires annual reports assessing where water quality is demonstrated to be

impaired or degraded as the result of NPS pollution by geographic region.

Based on the numerous programs in Virginia that address priority pollutant reductions and target watershed based activities this element is appropriately addressed. Virginia will incorporate reduction schedules presented in the Tributary Strategy documents and target reduction efforts in high priority watersheds.

Adequate separation distance for on-site sewage disposal systems (OSDS) and limit nitrogen loadings near nitrogen limited surface waters

The current regulations require a permit prior to construction, modification, operation or expansion of a sewage disposal and handling system. If the site does not meet the Sewage Handling and Disposal Regulations, then the permit to construct a septic system is denied. The Chesapeake Bay Preservation Area Designation and Management Regulations require that all existing on-site sewage disposal systems be pumped out at least once every five years. All high maintenance systems are inspected four times a year. Systems located adjacent to shellfish growing waters are inspected every three years and failures are reported for repairs.

In 1998, VDH submitted proposed changes in the regulations, including increasing the minimum separation distance from the water table for new disposal systems, to the Virginia Attorney General's Office. Anticipated changes will result in a minimum separation distance for new systems of 18 inches, regardless of soils or geologic conditions. Additionally, VDH has recently begun to support and promote the upgrading of systems to be more efficient when repairs are made rather than using conventional system replacement parts.

The ability to target OSDS replacement and restrictions to high priority watersheds and impaired waters is limited by the ability to accurately determine what, if any, loadings are the result of failing systems. In many instances, the impacts are localized due to local soil and geologic conditions. However, ongoing studies in Florida may provide some insight to identifying and implementing appropriate approaches to NPS pollution

impacts from OSDS. Currently, Virginia is also conducting analyses regarding NPS pollution through shallow water table studies. The studies are intended to show how variations in the water table affect the reductions of various pollutants. VDH will continue to conduct these studies and evaluate other alternatives for new systems and upgrading and repairing older ones that are failing.

Virginia recognizes that OSDS can be a source of NPS pollution. The state is awaiting results from studies being conducted in Virginia and Florida before taking specific actions. Additionally, there are no nutrient standards in Virginia, which prevents an accurate assessment of how many watersheds or impaired waters could be affected. In conjunction with the anticipated implementation of the new separation distance regulations in the fall of 1999, Virginia will initiate identification of options and approaches for addressing impacts from failing systems. Virginia will also explore alternative incentive and funding tools.

Roads, highways, and bridge runoff systems for roads

All state road construction projects are required to comply with the Virginia Stormwater Management Act and Regulations and the state Erosion and Sediment Control law for new development and facility upgrades. The Virginia Department of Transportation (VDOT) annually submits proposed stormwater runoff standards and technical specifications to DCR for review and approval. In addition, many VDOT personnel attend the workshops and training classes offered by DCR regarding these laws and techniques applicable to meeting the regulatory requirements.

Construction projects that are improvements, such as resurfacing, realignment, expansions or drainage projects, are evaluated to identify problems associated with runoff. For those projects with identified problems, VDOT implements stormwater runoff controls. These controls are based on the annually approved standards and specifications. VDOT has a Roadside Development Manual and a Maintenance Division Manual to direct highway projects. The ability to target specific projects for NPS pollution abatement is limited by the five-year capital improvement plan process VDOT relies on to direct project funding. Associated impacts are not identified until the project process is initiated.

Additional enhancements to the current process will be derived from the Tributary Strategy process, which will identify priority pollutants and a schedule to meet projected reductions. The Tributary Strategy planning documents are anticipated to be completed during the year 2000. Any required reductions will be incorporated into programs designed to address stormwater runoff. Additional efforts may be deemed necessary to reduce NPS pollution in high priority watersheds.

Virginia recognizes the significant potential for NPS pollution from roads, highways and bridges. Efforts will be initiated in 1999 to develop a protocol that incorporates the need to address NPS pollution in high priority watersheds and the schedules prepared for VDOT capital improvement plans. A tracking protocol will be developed that lists locations of projects requiring runoff abatement. In conjunction with other data Virginia's ability to monitor load reductions will be enhanced.

Runoff systems for local roads not within the Chesapeake Bay Preservation Areas

Currently, local roads are not required to meet the stormwater design standards and specifications of the two manuals used by VDOT. However, local roads are required to adhere to the ESC requirements and regulations, which abate NPS pollutant loadings during construction. In addition, local road construction must also adhere to the stormwater management ordinance in localities that have adopted an ordinance.

However, there are questions regarding the significance of NPS pollution impacts from local roads outside of RPAs and RMAs. As presented in the 1995 program document, approximately 80 percent of the coastal zone is within a RPAs and RMAs. Another way to state this is that only 20 per cent of the roads in the coastal zone are not addressed by one of these designations. Furthermore, not all roads outside CBPAs are local and some portion of what are considered to be local roads will be subject to local stormwater management ordinances, which would meet the management measures. It is also noted that some local roads are designed to meet VDOT standards with the intent of handing the road over to VDOT when a particular development is complete.

Virginia does not consider those local roads not addressed by the CBPA regulations to present a significant source of NPS pollution. This program element should be excluded from the management measures as a program condition. Virginia recognizes that some localized level of impact may exist and will address this element through the CZARA “additional management measure” approach. As an additional management measure Virginia will prepare GIS-based data to further support this position and will identify those localities with stormwater management ordinances for areas outside RPAs and RMAs. For those localities without a stormwater management ordinance, Virginia will actively seek development and adoption of an ordinance.

Virginia recognizes the potential for NPS pollution in the form of runoff from local roads. However, it does not appear to be a significant source due to the small percentage of local roads not currently addressed through CBLAD and VDOT regulations. To more accurately depict the potential for runoff potential Virginia will conduct an analysis during the first five-year planning period to determine what percentage of local roads outside of RPAs and RMAs actually exist.

Marinas and Recreational Boating

The majority of recreational and commercial boating activity occurs within the Chesapeake Bay and its tributaries. Marina and boat operations are also located along the Atlantic coast and on Virginia's inland lakes. A 1990 Virginia Department of Health (VDH) survey identified 773 facilities that can be classified as either marinas or boat moorings. Marina and boat operations are responsible for a relatively small percentage of the total pollutant load affecting Virginia's coastal waters. However, marina and boat activities can contribute significantly to local pollution problems.

Marinas and boat operations are sources of a variety of pollutants that can degrade water quality including sewage, erosion, habitat degradation, petroleum products, boat paint, and litter and other debris. The most serious problem is created by the improper handling of human waste at marinas and discharge of such waste from vessels. Water quality problems associated with human waste include excessive nitrification, which can lead to the depletion of dissolved oxygen, and health hazards posed by the presence of pathogenic organisms.

Stormwater runoff from hull maintenance operations

There are several state agency programs available to marina owners and operators that address all management measures except for stormwater runoff from hull maintenance facilities. The current permitting processes address hull maintenance facilities when new facilities are constructed or existing facilities make modifications. Those existing facilities that do not make modifications are not addressed.

Virginia recognizes the gap in technical and financial assistance available to existing hull maintenance facilities. Efforts will be initiated in 1999 to assess alternative approaches to address this issue. It is anticipated that, at a minimum, technical assistance will be provided through the development of a marina BMP manual and outreach efforts. This is to be achieved through the creation of a Marina Technical Advisory Service (MTAS). The MTAS will be located at the Virginia Institute of Marine Science (VIMS) at William and Mary College. VIMS currently houses the Virginia Sea Grant program and offers an opportunity to

coordinate two NOAA programs. To expedite these efforts, primary consideration may be given to pursuing assistance to those facilities located in high priority watersheds or impaired waters.

Fish waste

Fish waste is considered a solid waste, but the proper disposal of fish is not specifically addressed in current permit processes or adequately addressed through boater education programs. However, Virginia's solid waste regulations and Virginia Water Protection Permits specifically require the proper disposal of solid waste into an approved facility. The *Code of Virginia* further states that it is unlawful to cast any waste into state waters unless it is for fish or crab bait. Therefore, fish is statutorily addressed in permits because it is defined as solid waste, and solid waste must be disposed of properly.

Virginia recognizes the need to provide technical and educational assistance to marina owners and operators and recreational boaters regarding the disposal of fish waste. However, Virginia does not consider fish waste to be a significant source of NPS pollution, though there may be local or seasonal impacts. Information will be developed by the MTAS and provided to marina owners and operators and recreational boaters. To expedite these efforts, primary consideration may be given to focusing on those facilities located in high priority watersheds or impaired waters.

A process to provide sufficient technical assistance for marina development and operation

Virginia currently provides several technical and financial assistance programs through several agencies. However, it was determined that additional assistance was needed for marina owners and operators. Specifically, additional assistance in the area of development and operation was identified. The joint permit process provides some support through project reviews, which can result in changes to the location and operation of marinas. The same is true for the site plan review process from local governments. Neither of these activities is intended to be provided from an assistance standpoint and do not fully address the intent for technical assistance for development and operation.

In 1999, a pilot program will be created at the College of William and Mary. In conjunction with NOAA's Sea Grant program at the Virginia Institute of Marine Science, a Marina Technical Advisory Service will be initiated to provide technical assistance to marina owners and operators. This service will address other CNPSPC priorities as described above for fish waste and stormwater runoff from hull maintenance facilities. An advisory committee will also be developed and will include agency, citizen and industry representatives.

Hydromodification

Hydrologic modification is the alteration of stream flow by human activities. All hydrologic modifications, whether properly or improperly implemented, may result in nonpoint source (NPS) pollution to the waters of the Commonwealth of Virginia, and impact aquatic and riparian habitat.

The principle NPS pollution resulting from hydrologic modification is sediment. However, nutrients and toxics may also be associated with the sediment produced by these activities.

Watershed development and disturbances to riparian areas may result in:

- C increased streambank or shoreline erosion,
- C water quality degradation, and
- C destruction of sensitive aquatic habitat.

In particular, channel modifications undertaken in streams or rivers to straighten, relocate or change the depth or width of a channel can alter

- C instream water temperature,
- C the physical and chemical characteristics of bottom sediments,
- C the rate and characteristics of sediment, and
- C flooding frequencies of downstream property.

In addition, channel modifications often require maintenance dredging, which can diminish the suitability of aquatic and riparian habitat for fish and wildlife. While some adverse impacts associated with channel modification activities may be temporary, the loss of habitat and the need for ongoing maintenance can have significant long-term consequences.

Siting, constructing and operating dams and impoundments can result in significant changes in the ecology of streams and rivers. The construction of dams may result in considerable increases in nonpoint source pollution such as increased sediment loading and chemical contaminants. Dam operation can produce

changes in water temperature and water chemistry (pH and dissolved oxygen). In addition, dams and impoundments can disrupt the natural transport of sediment and can result in significant changes to instream flow.

For additional NPS program strategies, objectives, and tasks regarding implementation of hydromodification efforts refer to Chapter XI Hydromodification.

Process to improve surface water quality and restore instream and riparian habitat through the operation and maintenance of existing modified channels

Virginia requires a permit for all channelization projects, and considers impacts to water quality, floodplain, endangered species, and erosion and sediment control. The Joint Permit Application program, which is coordinated by the Virginia Marine Resources Commission (VMRC), is a process for federal and state agencies to comment on potential impacts of proposed projects within waters and wetlands of the state. In cases where impacts are considered significant, modeling may be required prior to any activity. Through Virginia's programs, primary and secondary impacts from channel modifications are assessed. The programs meet all statutory requirements. However, it is not clear if this process is sufficient to address other opportunities for restoration or improvements in water quality.

Currently, there are two programs that will assist in addressing this program element. The Chesapeake Bay Program recently developed a 2010 Riparian Restoration Initiative. This program is intended to conduct riparian restoration activities on 2010 miles of stream and shoreline in the Chesapeake Bay Watershed. Virginia's commitment for this program is 610 square miles of restoration. Another program is under development by DCR and the Natural Resources Conservation Service (NRCS) and is known as the Conservation Reserve Enhancement Program. This program is intended to support riparian restoration and filter strips on 35,000 acres throughout Virginia. In addition, the Agricultural BMP Cost-Share Program supports efforts to install BMPs.

It is unclear just exactly what the extent of opportunity for habitat improvement may be. Virginia recognizes the

likelihood that some localized opportunities exist. To further evaluate this, a stratified random sample survey and quantitative habitat analysis of channel operation and maintenance will be conducted in the coastal zone during 1999-2000. If the study results show that significant opportunity exists for restoration activities pertaining to channel operation and maintenance a process will be developed for implementation. In addition, Virginia will work closely with NRCS and the EPA Chesapeake Bay Program to ensure that some of the restoration activities available through their programs will occur within the coastal zone.

Manage the operation of dams to protect surface water quality and instream and riparian habitat, and to assess nonpoint source pollution problems resulting from excessive surface water withdrawals

Virginia requires a permit for all dam construction projects, and considers impacts to water quality, floodplain, endangered species, and erosion and sediment control. Through Virginia's programs, primary and secondary impacts from dams are assessed. The programs meet all statutory requirements. However, it is not clear if this process is sufficient to address other opportunities for restoration or improvements in surface water quality.

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It is unclear just exactly what the extent of opportunity for habitat improvement may be. Virginia recognizes the likelihood that some local opportunities exist. To further evaluate this, a stratified random sample survey and quantitative habitat analysis of dam operation and

maintenance will be conducted in the coastal zone during 1999-2001. If the study results show that significant opportunity exists for restoration activities pertaining to dam operation and maintenance a process will be identified for implementation. In addition, Virginia will work closely with the NRCS and EPA Chesapeake Bay Program to ensure that restoration activities available through their programs will occur within the coastal zone.

A process to identify and develop strategies to solve existing nonpoint source pollution problems caused by streambank or shoreline erosion that do not come up for review under existing permit authorities

There are several programs in Virginia that address erosion, two of which are non-permit oriented. The Shoreline Erosion Advisory Service (SEAS) is a voluntary program whereby a property owner initiates the activity. The property owner makes a request to SEAS to come inspect an erosion problem. SEAS staff conduct an inspection and provide a report to the property owner that details what steps can be taken to address the problem. It is then up to the owner to initiate remediation. In most instances, the property owner will need a permit prior to any construction activities.

The Chesapeake Bay Local Assistance Department (CBLAD) Comprehensive Plan process is the only program that meets the requirement for solving existing problems that do not come up for review under existing permit authorities. CBLAD requires that comprehensive plans include a program element specifically addressing areas of erosion as well as existing structures for shorelines and streambanks. A locality must identify areas of erosion, determine if it is a problem (based on performance criteria) and develop a strategy to resolve the problem.

The locality needs to reflect the comprehensive plan recommendations through the zoning ordinance to ensure implementation of the plan. This process allows Virginia to address erosion induced NPS pollution that is not triggered by a permitting process. Additionally, the comprehensive plan process, in conjunction with the CBPA performance criteria for buffers, SEAS technical assistance, riparian restoration initiatives, and the Agricultural BMP Cost-Share Program, Virginia has an

adequate number of tools at its disposal to address erosion issues independent of permitting actions.

Though Virginia has the tools available to address erosion, there is recognition for ways to improve and enhance current efforts. There are several BMP manuals that have been developed over the years that need to be reviewed and updated. The various agencies involved in permit and non-permit activities need to coordinate programs more closely. There is an identified need for updated information for shoreline and streambank erosion rates that can be addressed through updating previous reports. This will provide a level of comparative analysis and provide needed technical assistance to the localities. In addition, Virginia will work closely with the NRCS and EPA Chesapeake Bay Program to ensure that restoration activities available through their programs will occur within the coastal zone.

Wetlands, Riparian Areas and Vegetated Treatment Systems

Wetlands provide many ecological and socio-economic benefits including water quality improvement, aquatic productivity, fish and wildlife habitat, shoreline erosion control, stormwater treatment, flood protection, recreation, and economically valuable resources. Wetlands occupy a strategic position between upland and aquatic environments providing the opportunity to trap and filter NPS pollutants from upland runoff prior to entering adjacent waters.

As such, wetlands serve a variety of functions throughout the coastal zone. Wetlands provide spawning, nesting, shelter and nursery areas for fish and wildlife. Additionally, studies have shown that almost two thirds of all commercially harvested fish and shellfish species are associated with wetlands. Furthermore, recreational hunting and fishing interests as well as tourism are dependent upon wetlands.

Monitoring and Tracking

Water quality monitoring and tracking of nonpoint source pollution control implementation are essential elements of Virginia's Nonpoint Source Pollution Management Program. Monitoring and tracking support and direct program activities by providing information on water quality and the health of water resources. The Department of Environmental Quality (DEQ) administers the state ambient water quality and fall line monitoring programs. The Department of Conservation and Recreation (DCR) is the lead state agency for supporting and tracking nonpoint source (NPS) pollution control implementation. Both DCR and DEQ support citizen monitoring efforts in Virginia. Identifying water quality problems and the sources of impairment is a major focus of Virginia's water quality monitoring program.

Historically, Virginia has focused monitoring efforts on point source discharges. Although DEQ has relocated many of its monitoring stations and expanded its monitoring network to enhance ambient water quality data collection and support nonpoint source pollution monitoring needs, the placement of monitoring stations continues to reflect a point source bias. A key challenge to Virginia monitoring programs will be to ensure that the location and design of monitoring stations reflect the increasing focus on reducing nonpoint sources of water pollution.

Lack of stream flow data and data consistency have also been identified as significant monitoring issues. As Virginia moves forward with developing total maximum daily loads (TMDLs) for streams impaired by nonpoint sources of pollution, data consistency and the availability of flow data will be essential for analyses of pollutant load allocations.

A plan to assess over time the success of the management measures in reducing pollution loads and improving water quality

There are several programs in Virginia that conduct monitoring and tracking throughout the coastal zone and the state as a whole. DEQ is responsible for preparing the 305(b) report on the quality of the state's waters. The information in this report is collected through more than 2,000 monitoring stations. The DCR Agricultural

BMP Cost-Share Program tracks the installation of BMPs by latitude and longitude coordinates. Other state agencies that provide support are CBLAD, DOF, Department of Game and Inland Fisheries (DGIF), Department of Mines, Minerals, and Energy (DMME), VCE, and VDH. Federal agencies that provide support are NRCS and the U.S. Geological Survey (USGS).

Virginia's monitoring and tracking programs, and accessibility to other state and federal data, are sufficient to allow monitoring and tracking of the implementation of the CZARA management measures. Additionally, many programs contain scheduled reporting requirements. The main impediment to meeting this program element is the lack of an identified reporting process that relates other state and federal program activities to implementation of the CNPSPC program.

The Monitoring, Tracking, Assessment and Watershed Prioritization Chapter of this document identifies a series of specific actions to be taken incorporating physical, chemical and biological parameters. This information will be critical in allowing Virginia to assess the effectiveness of its CNPSPC program.

For additional NPS program strategies, objectives, and tasks regarding implementation of monitoring and tracking efforts refer to Chapter IX Monitoring and Tracking.

OBJECTIVES, STRATEGIES & TASKS

The implementation strategies and tasks are presented in a format that recognizes the overall 15-year planning horizon of the Administrative Changes provided in October 1998 and the Additional Guidance provided in March 1999 by NOAA. The tasks within each source category are mainly presented chronologically by the year in which it is anticipated to be completed. In most instances the tasks are not hierarchical, rather these time frames are presented in terms that are considered to be realistic and basically independent actions to support strategy implementation and achievement of the objectives. It is anticipated that program reviews will be

conducted at a minimum of five-year intervals. The program review element is not included in the tables, however, within a category a particular strategy or task may require this.

In general terms, the overall approach is to focus on watersheds with the most severe nonpoint source pollution problems. This approach will allow Virginia to incorporate and integrate information from other programs such as the Tributary Strategy process, the Agricultural BMP Cost-Share Program and the Chesapeake Bay Program. It also provides a program support mechanism through targeting funds to areas that are receiving other program funds, such as the Section 319 statewide nonpoint source program, Chesapeake Bay Local Assistance Department funds, the state Water Quality Improvement Fund, or the Chesapeake Bay Implementation Grant. By coordinating efforts where they are most needed Virginia expects to achieve significant improvements in water quality. In addition, this level of program integration and coordination will assist in meeting the objectives of the Clean Water Action Plan.

Many of the strategies and tasks presented in the preceding chapters are relevant to the issues presented in this chapter. Though the strategies and tasks of the preceding chapters are not repeated verbatim in this chapter, where appropriate they are reflected in the strategies and tasks presented in the tables below. The reason for this is that the Section 319 and Coastal NPS pollution programs differ slightly in their respective reporting and implementation requirements. However, it is sensible to present both in a single document under the umbrella of a statewide NPS pollution management program. In comparing the two programs, some of the strategies and tasks presented in this document are mutually exclusive, while most are mutually supportive. Specifically, the Watershed Prioritization, Agriculture, Forestry, Construction and Development, Monitoring and Tracking, and Hydromodification Chapters detail additional objectives, strategies, and tasks that will contribute to the implementation of the management measures within the coastal zone. Where feasible and appropriate the 319 and Coastal NPS program efforts will be coordinated as described in Chapters XII and XIV. These efforts will be detailed in future reports evaluating program implementation activities.

MANAGEMENT MEASURES

The listing of program elements is not intended to represent any prioritization of effort, rather it follows the sequence of categories used in the NOAA and EPA *Guidance for Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* and Virginia's *Coastal Nonpoint Source Pollution Control Program* submitted in October 1995. Similarly, the listing of multiple participants for achieving program tasks are alphabetical and are not intended to represent any particular priority or level of responsibility. Participants are listed based on the fact that the agency has an interest and a role in accomplishing implementation of the strategy or task.

In many instances a funding source has not been identified. It is inappropriate to obligate a funding source prior to having implementation mechanisms in place. As the program and participants move forward, funding sources will be identified and targeted for achieving full program implementation.

Management Measure: Irrigation Water Management

OBJECTIVE 1				
<i>Improve the irrigation management skills of Virginia irrigators in order to protect Virginia's surface and groundwater resources</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
1.1 Improve the awareness of irrigators with respect to NPS pollution risks	Update irrigation technical assistance documents and distribute to irrigators, SWCDs, local governments and other appropriate agencies	•CBLAD •DCR •DEQ •VCE	1999 - 2001	•General Fund •CZARA
1.2 Promote pollution abatement through implementation of appropriate BMPs	Update irrigation technical assistance documents and distribute to irrigators, SWCDs, local governments and other appropriate agencies	•DCR •DEQ •VPI&SU •VDACS	1999 - 2001	•General Fund •CZARA
	Conduct a series of workshops throughout the coastal zone targeting irrigators, regulators, environmental planners, and local government officials	•DCR •DEQ •VPI&SU •VCE •VDACS	1999 - 2001	•General Fund •CZARA
	Work with academic institutions to identify options for short courses, off-site learning, and other education initiatives that can be made available to irrigators	•DCR •VPI&SU •VCE •VDACS	1999 - 2002	•Unknown
	Evaluate development of an irrigation advisory service through local VCE offices to enhance irrigation water management, including a tracking system to determine effectiveness of program	•DCR •DEQ •VCE •VDACS	1999 - 2002	•Unknown
1.3 Provide education and technical assistance to irrigators		•DCR •SWCDs •VCE •VDACS	Annually 2001-2014	•Unknown

Management Measure: Forestry

OBJECTIVE 2				
<i>Promote and support reduced water quality impacts and the use of best management practices (BMPs) for forestry operations</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
2.1 Achieve a 93 percent rate for forestry operation sites where no water quality impacts occur by 2004	Where water quality impacts occur, enforce corrective BMP measures to include follow-up site visits	•DOF	1999-2004	•DOF
	Conduct site assessments through the semi-annual audit and determine if a water quality impact has occurred	•DOF	Annually 2000-2014	•DOF
2.2 Maintain a 90 percent rate for implementing appropriate BMPs through site inspections	Incorporate BMP location information into NPS pollution watershed assessment database	•DCR •DOF	1999-2004	•DCR •DOF
	Continue to conduct training workshops annually	•DOF •Virginia Forestry Assoc.	1999-2004	•DOF •VFA
	Conduct site inspections to determine if appropriate BMP are installed	•DOF	Annually 1999 - 2014	•DOF

Management Measure : Total suspended solids outside of the Chesapeake Bay Preservation Areas for new development

OBJECTIVE 3				
<i>Develop stormwater management plans throughout the coastal zone</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
3.1 Achieve an 80 percent reduction in TSS throughout coastal Virginia from new development.	Conduct reviews of current programs to determine effectiveness	•DCR •DEQ •PDCs •CBLAD	1999-2001	•Unknown
	Demonstrate to localities economic efficiencies of implementing stormwater management practices by evaluating actual projects and conducting comparative analyses of costs	•DCR •CBLAD	1999-2001	•CZARA
	Incorporate NPDES phase II requirements where appropriate	•DCR •DEQ	1999-2002	•Unknown
	Develop a tracking database/spreadsheet that incorporates DEQ, DCR and CBLAD local program and permit tracking information	•CBLAD •DCR •DEQ	1999-2003	•CZARA
	Assist localities in high priority watersheds to develop and implement stormwater management plans	•CBLAD •DCR •PDCs	1999-2004	•CZARA •General Fund
	Assist localities in incorporating recommendations from the Tributary Strategy process	•CBLAD •DEQ •DCR •PDCs	1999-2004	•Unknown
	Work with the Natural Resources Conservation Service Conservation Reserve Enhancement Program to target riparian restoration efforts	•DCR •DOF •NRCS •SWCDs	1999-2004	•NRCS •DCR •General Fund

OBJECTIVE 3 (Cont.)				
<i>Develop stormwater management plans throughout the coastal zone</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
3.1 (Cont.) 80 percent reduction in TSS	Work with federal, state and local agencies to target riparian restoration activities for the Chesapeake Bay Program Riparian Restoration initiative for 610 miles of restoration by 2010	•CBLAD •DCR •DOF •EPA •NRCS	1999-2009	•DCR •DOF •EPA •NRCS
	Assist localities in medium priority watersheds to develop and implement stormwater management plans	•CBLAD •DCR •PDCs	2004-2009	•Unknown
3.2 Improve administration of Erosion and Sediment Control law through enhanced technical assistance, increased enforcement and improved coordination among agencies	Conduct three training and certification courses annually for Erosion and Sediment Control for plan reviewers, engineers, local E&S staff	•CBLAD •DCR •DEQ •Local governments •PDCs	Annually 1999-2014	•Unknown •DCR
	Work with appropriate agencies to craft legislation for additional stormwater management measures	•CBLAD •DCR •DEQ •Local governments •PDCs	1999-2014	•Agencies •Unknown
	Assist localities in low priority watersheds to develop and implement stormwater management plans	•CBLAD •DCR •PDCs	2009-2014	•General Fund

Management Measure : Priority watershed pollutant reduction opportunities

OBJECTIVE 4				
<i>Improve water quality in those watersheds most in need of restoration and nonpoint source pollution reduction actions</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
4.1 Target high priority watersheds and impaired waters to reduce NPS pollution	Begin incorporation of Tributary Strategy recommendations into watershed planning process	•CBLAD •DEQ •DCR •PDCs	1999-2002	•Agencies
	Identify high priority watersheds and impaired waters and work with local governments to analyze impacts from existing development	•CBLAD •DCR •DEQ •PDCs	1999-2003	•Unknown
	Track NPS pollution TMDL activities in the coastal zone to analyze effectiveness of implementation of management measures	•CBLAD •DCR •DEQ	1999-2004	•Unknown •DCR
	Work with the Natural Resources Conservation Service Conservation Reserve Enhancement Program	•DCR •DOF •NRCS •SWCDs	1999-2004	•DCR •DOF •EPA •NRCS
	Work with localities to incorporate monitoring and maintenance procedures to determine efforts to reduce priority pollutants	•CBLAD •DCR •DEQ •EPA •Local governments •PDCs •SWCDs	1999-2004	•Unknown

OBJECTIVE 4 (Cont)				
<i>Improve water quality in those watersheds most in need of restoration and nonpoint source pollution reduction actions</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
4.1 (Cont.) Target high priority watersheds and impaired waters	Develop watershed management plans	•DCR •DEQ •Local governments •PDCs	1999-2004	•Unknown
	Assist localities in incorporating recommendations from the Tributary Strategy and Cooperative Watershed Initiative processes	•CBLAD •DEQ •DCR •PDCs	1999-2004	•Agencies
	Work with federal, state and local agencies to target riparian restoration activities for the Chesapeake Bay Program Riparian Restoration initiative for 610 miles of restoration by 2010	•DCR •DOF •EPA •NRCS	1999-2009	•DCR •DOF •EPA •NRCS
4.2 Continue annual Water Quality Improvement Act reporting to the governor and General Assembly on geographically impaired or degraded waters		•DCR •DEQ	1999-2014	•WQIF

Management Measure: Adequate separation distance between new on-site disposal systems (OSDS) and groundwater closely hydrologically connected to surface water and limiting nitrogen loadings from new and operating on-site disposal systems near nitrogen limited surface waters

OBJECTIVE 5				
<i>Reduce existing on-site sewage disposal systems (OSDS) impacts to water quality and prevent impacts from new systems</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
5.1 Increase the separation distance from the current minimum of two inches for new OSDS	Implement regulations requiring a minimum separation distance of 18 inches without pretreatment	•VDH	1999-2001	•VDH
5.2 Limit nitrogen loadings to nitrogen impaired waters	Evaluate the feasibility of requiring system inspections upon the sale of property	•CBLAD •DCR •Local health dept's •VDH	1999-2002	•Unknown
	Evaluate options for cost-sharing or tax incentives to replace or upgrade older OSDS	•CBLAD •DCR •Local health dept's •VDH	1999-2002	•N/A
	Continue to promote the use of new innovative techniques for OSDS through local health departments	•CBLAD •DCR •DEQ •VDH	1999-2004	•N/A
	Target efforts, based on the results of ongoing studies, to identify economically achievable options for targeting efforts to high priority watersheds or where there are NPS pollution impairments for nitrogen	•CBLAD •DCR •DEQ •VDH	1999-2004	•Unknown

OBJECTIVE 5 (Cont.)				
<i>Reduce existing on-site sewage disposal systems (OSDS) impacts to water quality and prevent impacts from new systems</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
5.2 (Cont.) Limit nitrogen loadings to nitrogen impaired waters	Review effectiveness of efforts by conducting a random sample analysis of projects completed between 1999 and 2003 to include sampling on and offsite	<ul style="list-style-type: none"> •CBLAD •DCR •DEQ •VDH 	2003-2004	•Unknown
5.3 Apply five-year pump-out requirements in coastal areas outside of the Chesapeake Bay Preservation Areas		<ul style="list-style-type: none"> •DCR •Local health dept's •PDCs •VDH 	1999-2002	•Unknown
5.4 Continue to provide educational materials to the public about inspecting, maintaining and upgrading septic systems		<ul style="list-style-type: none"> •DCR •Local health dept's •PDCs •VDH 	1999-2014	•General Fund

Management Measure: Roads, highways, and bridge runoff systems

OBJECTIVE 6				
<i>Reduce runoff from roads, highways, and bridges</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
6.1 Target implementation of runoff systems in high priority watersheds	Work with VDOT to identify activities listed in their capital improvement plans by the 14-digit hydrologic unit code in relation to watershed prioritization	•DCR •VDOT	1999-2004	•N/A
6.2 Prepare list of projects by watershed	Develop a tracking system that shows where runoff is being reduced	•DCR •VDOT	1999-2002	•N/A

Management Measure: Runoff systems for local roads not within the Chesapeake Bay Preservation Areas

OBJECTIVE 7				
<i>Reduce runoff from local roads outside Chesapeake Bay Preservation Areas</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
7.1 Reduce runoff from local roads	Identify localities whose stormwater management ordinances affect local roads outside CBPAs	•CBLAD •DCR	1999-2001	•Unknown
	Quantify extent of local roads outside of CBPAs	•CBLAD •DCR •PDCs	1999-2003	•Unknown
7.2 Assist localities to develop stormwater management ordinances		•CBLAD •DCR	1999-2004	•DCR •CZARA

Management Measure: Stormwater runoff from hull maintenance operations

OBJECTIVE 8				
Reduce runoff from hull maintenance facilities				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
8.1 Develop and implement a technical assistance program	Provide technical guidance through the development of a Marina BMP manual	•DCR •DEQ •Sea Grant •VMRC	1999-2001	•CZARA
	Develop hull maintenance BMP installation tracking program	•DCR •DEQ •Sea Grant •VMRC	1999-2001	•CZARA
	Evaluate stormwater management ordinances for localities with hull maintenance facilities for implementation effectiveness	•CBLAD •DCR •DEQ •Sea Grant	1999-2002	•CZARA
	Evaluate need to focus on high priority watersheds or impaired waters	•DCR •DEQ •Sea Grant •VMRC	2002-2003	•CZARA

Management Measure : Proper disposal of fish waste

OBJECTIVE 9				
<i>Reduce potential NPS pollution from improper disposal of fish waste</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
9.1 Develop and implement an education and outreach program for marina owners and operators and recreational boaters	Provide technical guidance through the development of a Marina BMP manual	•DCR •DEQ •Sea Grant •VMRC	1999-2000	•CZARA
	Develop education materials that can be provided to boaters, recreational and sports fishing organizations and local officials	•DCR •DEQ •Sea Grant •VMRC	1999-2001	•CZARA
	Evaluate need to focus on high priority watersheds or impaired waters	•DCR •DEQ •Sea Grant •VMRC	2002-2003	•Unknown
9.2 Expand use of fish cleaning stations and receptacles		•DEQ •DCR •VMRC •Sea Grant	1999-2014	•Unknown

Management Measure : A process to provide sufficient technical assistance for marina development and operation

OBJECTIVE 10				
<i>Enhance technical assistance for development and operation to marina owners and operators</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
10.1 Convene an Advisory Committee		•DCR •DEQ •Sea Grant •VMRC	1999-2001	•N/A
10.2 Create a technical advisory service	Define role of staff and service priorities	•DCR •DEQ •Sea Grant •VMRC	1999-2000	•CZARA
	Hire a marine technical specialist	•DCR •DEQ •Sea Grant •VMRC	1999-2000	•CZARA
	Develop a marina BMP manual	•DCR •DEQ •Sea Grant, •VMRC	1999-2000	•CZARA

	Provide technical assistance to marina owners and operators, consultants, businesses and environmental groups in the coastal zone regarding social and economic, regulatory compliance, siting and design criteria, coastal hazard mitigation, fish waste, stormwater runoff, boat operation, and public health and safety issues	•DCR •DEQ •Sea Grant •VMRC	1999-2000	•CZARA
OBJECTIVE 10 (Cont.)				
<i>Enhance technical assistance for development and operation to marina owners and operators</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
10.3 Conduct program review and identify priorities for 2001-2004		•DCR •DEQ •Sea Grant •VMRC	2000-2001	•N/A

Management Measure A process to improve surface water quality and restore instream and riparian habitat through the operation and maintenance of existing modified channels

OBJECTIVE 11				
<i>Improve surface water quality, and instream and riparian habitat</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
11.1 Identify the extent to which opportunities exist	Conduct a stratified random sample survey of areas of channel operation and maintenance	•DCR •DEQ	2000-2001	•CZARA

	Develop protocol for identifying opportunities incorporating results of sample survey into permit/review processes	•DCR •DEQ •DGIF •NRCS •VDOT •VMRC	2001-2002	•CZARA
11.2 Work with the Natural Resources Conservation Service Conservation Reserve Enhancement Program to target riparian restoration efforts		•DCR •DOF •NRCS •SWCDs	1999-2004	•NRCS •DCR
11.3 Work with federal, state and local agencies to target riparian restoration activities of the Chesapeake Bay Program Riparian Restoration initiative for 610 miles of restoration by 2010		•DCR •DOF •EPA •NRCS	1999-2009	•DCR •DOF •EPA •NRCS

Management Measure : Manage the operation of dams to protect surface water quality and instream and riparian habitat and to assess nonpoint source pollution problems resulting from excessive surface water withdrawals

OBJECTIVE 12				
<i>Improve surface water quality, and instream and riparian habitat</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
12.1 Identify the extent to which opportunities exist	Conduct a stratified random sample survey of areas of dam operation and maintenance	•DCR •DEQ	1999-2000	•CZARA
	Develop protocol for identifying opportunities incorporating results of sample survey into permit and/or review processes	•DCR •DEQ •DGIF •NRCS •VDACS •VDOT •VMRC	2000-2001	•CZARA
	Work with the Natural Resources Conservation Service Conservation Reserve Enhancement Program to target riparian restoration efforts	•DCR •DOF •NRCS •SWCDs	1999-2004:	•DCR •DOF •EPA •NRCS

12.2 Work with federal, state and local agencies to target riparian restoration activities of the Chesapeake Bay Program Riparian Restoration initiative for 610 miles of restoration by 2010		<ul style="list-style-type: none"> •DCR •DOF •EPA 	1999-2009	<ul style="list-style-type: none"> •DCR •DOF •EPA •NRCS
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Management Measure : A process to identify and develop strategies to solve existing nonpoint source pollution problems caused by streambank or shoreline erosion that do not come up for review under existing permit authorities

OBJECTIVE 13				
<i>Enhance existing non-permit-based streambank and shoreline erosion control programs</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
13.1 Support development of shoreline and streambank erosion documents	Enhance shoreline and streambank structural information for technical assistance to localities	•CBLAD •DCR •DEQ •DGIF •VMRC	1999-2001	•CBLAD •CZARA •Unknown
	Initiate and complete an update of a state study identifying locations and rates of erosion	•CBLAD •DCR •DEQ •DGIF •VDACS •VMRC	2000-2002	•CBLAD •CZARA
	Conduct interagency review and update appropriate BMP manuals	•CBLAD •DCR •DEQ •DOF •NRCS •VDOT •VMRC	2000-2003	•Unknown
	Enhance public awareness of Shoreline Erosion Advisory Service through outreach efforts and publication distribution	•DCR	1999-2014	•DCR
13.2 Enhance agency coordination regarding permits and data incorporation	Develop and implement an MOU between DCR and CBLAD to define a protocol for incorporating respective information into each program	•CBLAD •DCR •DEQ •VMRC	1999-2001	•N/A

OBJECTIVE 13 (Cont.)				
<i>Enhance existing non-permit-based streambank and shoreline erosion control programs</i>				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
13.2 (Cont.) Enhance agency coordination regarding permits and data incorporation	Establish protocol to ensure all agencies collect data using the same methodology	<ul style="list-style-type: none"> •CBLAD •DCR •DEQ •DOF •DGIF •VDACS •VDOT 	1999-2001	•N/A
	Conduct a review of how agencies utilize CBLAD comprehensive plan erosion element information	NPSAC	1999-2002	•N/A
13.3 Conduct review of comprehensive plans and implementation of erosion strategies		<ul style="list-style-type: none"> •CBLAD •DCR •DOF •NRCS •VMRC 	2003-2005	<ul style="list-style-type: none"> •CBLAD •Unknown

Management Measure : A plan to assess over time the success of the management measures in reducing pollution loads and improving water quality

OBJECTIVE 14				
Assess implementation of management measures				
STRATEGIES	RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
14.1 Monitor and track implementation of 6217 program	Identify sources and types of information required to assess implementation of management measures	•DCR •DEQ	1999-2001	•N/A
	Identify reporting format and schedules	•DCR •DEQ	1999-2001	•N/A
	Prepare initial report to coincide with NOAA 312 evaluation - DCR, DEQ	•DCR •DEQ	1999-2002	•N/A
14.2 Continue monitoring and preparing biennial Section 305 (b) reports		•DCR •DEQ	1999-2014	•DEQ •DCR •EPA
14.3 Continue annual reporting requirements of the Water Quality Improvement Act for BMP implementation		•DCR	1999-2014	•WQIF
14.4 Continue annual reporting requirements of the Agricultural BMP Cost-Share Program for BMP implementation		•DCR	1999-2014	•DCR •EPA
14.5 Continue to track land use and BMP location information		•DCR •DEQ •DOF •EPA •VDH	1999-2014	•DCR •EPA